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ABSTRACT

Three remote feedback techniques involving micro-teaching and video recording were tested to facilitate inservice teacher education to teachers in isolated circumstances. From a population of 57 beginning teachers of health occupations education, trade and industrial education, and technical education in Colorado, a sample of 39 teachers was selected randomly and assigned to three equal-treatment groups. The pretest-posttest control group design was selected to study video-phone feedback, video-mail feedback, and video-self-evaluation. A panel of two experienced state supervisors rated the 5-minute pretest lesson and the posttest performance of the teachers with a six-point rating scale. In addition, a satisfaction scale and a reaction questionnaire were administered. Conclusions were: (1) Feedback from the teacher educator via mailed videotape presentations or via telephone had no more effect on improving teacher performance than a video-self-evaluation, (2) Teacher satisfaction with the three remote techniques was not dependent upon the type of feedback received, and (3) Remote techniques in an inservice program were found feasible and did help beginning teachers analyze and change their teaching behavior. (GR)

Butler (C1)

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Research and Development Series No. 40

## Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education: Phase X--

# Remote Feedback Techniques for Inservice Education

VT 011 433

The Center for Vocational and Technical Education
The Ohio State University, 1900 Kenny Rd., Columbus, Ohio 43210

The Center for Vocational and Technical Education has been established as an independent unit on The Ohio State University campus with a grant from the Division of Comprehensive and Vocational Education Research, U. S. Office of Education. It serves a catalytic role in establishing consortia to focus on relevant problems in vocational and technical education. The Center is comprehensive in its commitment and responsibility, multidisciplinary in its approach, and interinstitutional in its program.

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2. To stimulate and strengthen state, regional, and national programs of applied research and development directed toward the solution of pressing problems in vocational and technical education;

3. To encourage the development of research to improve vocational and technical education in institutions of higher education and other appropriate settings;

4. To conduct research studies directed toward the development of new knowledge and new applications of existing knowledge in vocational and technical education;

5. To upgrade vocational education leadership (state supervisors, teacher educators, research specialists, and others) through an advanced study and inservice education program;

6. To provide a national information retrieval, storage, and dissemination system for vocational and technical education linked with the Educational Resources Information Center located in the U. S. Office of Education.

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RESEARCH AND DEVELOPMENT SERIES NO. 40

# ASSESSMENT OF MICRO-TEACHING AND VIDEO RECORDING IN VOCATIONAL AND TECHNICAL TEACHER EDUCATION: PHASE X-- REMOTE FEEDBACK TECHNIQUES FOR INSERVICE EDUCATION

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U.S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE

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# PREFACE

As part of The Center's program effort in teacher education, we have engaged in a series of studies in the project, "Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education," to find more effective and efficient ways of using micro-teaching and video recording in the preparation and development of vocational teachers. This report describes a field test of micro-teaching and video recording applications designed to accomplish inservice teacher education without requiring expensive time loss in long-distance travel by the teacher or teacher educator. We trust that vocational teacher educators and researchers will find the techniques described in this report both interesting and beneficial.

The study was conducted by The Center through cooperation with the Department of Vocational Education, Colorado State University, Fort Collins. We are indebted to Dr. Duane Blake, Professor and Chairman of that department, for his assistance in implementing the field test.

We wish to acknowledge the following persons for their services in completing the study: From The Center--Dr. C. J. Cotrell, principal investigator; Dr. C. R. Doty, associate investigator; and Dr. W. A. Cameron, coordinator of the study. From the Department of Vocational Education at Colorado State University--Dr. R. E. Glenn, associate professor and co-investigator.

We also appreciate the efforts of the following persons who served as reviewers for this publication: Dr. Floyd M. McCormick, Head, Department of Agricultural Education, University of Arizona, Tucson; Dr. W. R. Miller, Professor and Chairman, Department of Practical Arts and Vocational Education, University of Missouri, Columbia; Drs. Edward Ferguson and William Hull, research and development specialists of The Center and Dr. A. J. Miller, coordinator of Development and Training for The Center.

Robert E. Taylor
Director
The Center for Vocational
and Technical Education

# INTRODUCTION

The results of the feasibility testing of three remote feedback techniques to find ways of facilitating inservice teacher education are described in this report. Each technique was developed to make it possible for teacher educators to utilize their time more efficiently while serving teachers during the regular school year. Such techniques are needed particularly in states where terrain and teacher education staffing precludes assistance to beginning teachers. Teacher educators, especially those who are concerned about the many hours of valuable time they lose in traveling to schools to provide itinerant teacher education, should find all three of the techniques interesting and promising.

We wish to acknowledge the outstanding cooperation of the Department of Vocational Education at Colorado State University, the secondary and post-secondary schools, the local supervisors, and the 36 teachers who participated so willingly in the field trial of these experimental teacher education techniques. We are indebted to Dr. Ronald E. Glenn for his enthusiastic participation as teacher educator and co-investigator.

Recognition is due also to the evaluation panel members, Mr. Willis Bauer and Mr. Leon Linton, assistant supervisors of the Division of Vocational Education, State Department of Education, Columbus, Ohio, for their valuable assistance in rating the video taped pretest and posttest teaching sessions.

The investigators are most appreciative of the encouragement and administrative support of this effort provided by the director of The Center, Dr. Robert E. Taylor; the coordinator of development and training, Dr. Aaron J. Miller; and the coordinator of research, Dr. Edward J. Morrison. We also appreciate the assistance of the many supporting personnel of The Center and particularly the editorial director, Mr. John Meyer and his staff.

W. A. Cameron

C. J. Cotrell

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# SUMMARY

The major purpose of this study was to field test three remote feedback techniques developed for inservice teacher education. Vocational teachers who, because of their isolated circumstances, do not have normal access to the college campus, extension classes or itinerant teacher education, need assistance which may be provided through remote supervision techniques involving micro-teaching and video recording. The specific objectives of the study were to: 1) assess the comparative effect of three remote feedback techniques on teacher performance, 2) determine the level of expressed satisfaction among the teachers of the three treatment groups, 3) assess the effects of remote feedback techniques on the teaching mannerisms of the participants, and 4) determine the feasibility for the use of remote techniques for inservice teacher education.

Fifty-seven beginning teachers from the areas of health occupations education, trade and industrial education, and technical education in Colorado comprised the population of the study. From this population, a sample of 39 teachers was selected randomly and assigned to one of three equal size treatment groups. The experimental design selected for the study was The Pretest-Posttest Control Group Design.

After being pretested (videotaped teaching a five-minute lesson), all participants were mailed an instructional model on the teaching skill of introducing a lesson and nine illustration models. Each teacher was instructed to view the instructional model as many times as necessary to study the skill and to practice the skill by teaching a five-minute lesson to four students. The five-minute lesson was videotaped and the recording was replayed and critiqued by the teacher. Each teacher mailed his videotape to the teacher educator.

Upon receiving the videotape from a teacher assigned to treatment number one, video-phone feedback, the teacher educator critiqued the teacher's performance. He contacted the teacher by telephone and discussed the teaching session. The videotape from a teacher assigned to treatment number two, video-mail feedback, was critiqued and the teacher educator recorded his comments on the tape following the teacher's taped lesson. A teacher in treatment number three, video-self-evaluation, presented the tapes to his local supervisor or if no local supervisor was involved, the tapes were mailed to the teacher educator. The tapes were reviewed and returned, but no suggestions for improvement were offered the teacher by the supervisor or teacher educator. Each teacher in

the group had to rely entirely on the self-evaluation inputs for guidance on his improvement efforts.

After receiving their returned videotapes, the teachers in each group reviewed the critiques and their tapes, then planned and retaught the same lesson to a different group of students. The self-evaluations by the teacher and/or critiques by the teacher educator were repeated on the reteach sessions. The described teaching-reteaching cycles were repeated for two more teaching skills, i.e., questioning and demonstrating a manipulative skill.

At the end of the experiment which lasted eight weeks, posttests were made of the 36 participants who had completed the program. In addition, a satisfaction scale and a reaction questionnaire were administered.

A panel composed of two experienced state supervisors rated the pretest and posttest performance of the teachers with a multifactor instrument consisting of a six-point rating scale. An analysis of covariance computed on the data revealed no statistically significant differences among the three treatment groups in regard to teaching performance on the composite of the three teaching skills or on any single teaching skill. An analysis of variance on the satisfaction data indicated no differences among the three groups on the expressed level of satisfaction with the three techniques used. A chi-square test computed on the teaching mannerism data revealed that there was a significant difference in changes from pretests to posttests among the three treatment groups. Further analyses indicated the teachers in the video-mail and the video-self-evaluation groups improved their teaching mannerisms significantly more than the teachers in the video-phone group. As indicated by a paired t-test, all groups improved their teaching performance from the pretests to posttests for the composite of the three teaching skills.

From the findings it was concluded that remote feedback from the teacher educator via mailed videotaped presentations or via telephone had no more effect on improving the teachers' performance on selected teaching skills than the feedback they received from viewing models and viewing and critiquing their own videotaped lessons. However, as an interesting by-product, teachers who critiqued their own performance and/or viewed the teacher educator's presentation via video recordings made more positive changes in teaching mannerisms than teachers who received feedback via telephone. It was further concluded that the teachers' satisfaction with the three remote techniques tested was not dependent upon the type of feedback received. In addition, the application of remote techniques in an inservice program was found to be feasible and did help beginning teachers analyze and change their teaching behavior.

Recommendations were made for continuation of the use of the remote techniques in Colorado's inservice vocational teacher education and for further research and improvement in the applications of remote techniques.

# ASSESSMENT OF MICRO-TEACHING AND VIDEO RECORDING IN VOCATIONAL AND TECHNICAL TEACHER EDUCATION: PHASE X--

# REMOTE FEEDBACK TECHNIQUES FOR INSERVICE EDUCATION

# CHAPTER I

# BACKGROUND FOR THE STUDY

Vocational-technical educators have long recognized the need for and value of adequate inservice education for teachers of vocational and technical education. The Smith-Hughes Act of 1917 incorporated provisions for both preservice and inservice education of vocational teachers. Succeeding federal legislation, including the Vocational Education Act of 1963, reemphasized the significance of inservice education for those responsible for the programs of vocational-technical education. New technical knowledge and rapid changes in the educational structure of our nation's schools have placed expanded demands upon colleges and universities for more effective programs of inservice teacher education. Moreover, the increased cost of providing effective education is compounding the problems connected with inservice education.

In vocational and technical education, a large number of persons who have had no formal education in the profession of teaching are recruited from industry to teach vocational and technical subjects. These new entrants to the teaching profession are usually required to attend a one- or two-week workshop on fundamental teaching techniques before being placed in a teaching position. Throughout their first year of teaching many teachers do not have the benefit of assistance from teacher educators or from extension courses on teaching methods. Consequently, these beginning teachers do not receive in-depth instruction in pedagogy until the summer following their first year of employment, therefore, they are left, for the most part, to their own trial and error methods of learning to teach during the first year.

The situation described above is understandable when the problems involved in providing adequate inservice training are considered. The beginning teachers are necessarily placed in schools where they are needed most; thus, great distances usually exist between the various locations of the teachers. The expense involved and the number of teacher educators or supervisors that it would take to serve these beginning teachers prohibit the maintenance of an adequate inservice teacher education program.

Current educational methodology involving the application of micro-teaching and video recording has shown promise for improving the preservice teacher education program in general secondary and elementary education. By combining micro-teaching and video

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recordings with remote inservice techniques such as telephone and mailed videotaped instructions, it seemed feasible to design a system for providing a more effective program of inservice education for beginning teachers of vocational-technical education.

With the above considerations in mind, the major focus of this study was to assess the use of remote teacher education techniques in inservice education on selected teaching skills for beginning vocational-technical teachers in the State of Colorado.

## RESEARCH QUESTIONS

To fulfill the purpose of the study, answers to the following questions were sought:

1. Which of the three remote techniques (video-phone, video-mail, or video-self-evaluation) will result in the greatest improvement in teaching performance on the following three teaching skills as a composite and separately:

    a. Introducing a lesson

    b. Questioning

    c. Demonstrating a manipulative skill

2. Are there significant differences in the levels of expressed teacher satisfaction among the treatment groups?

3. Are there significant differences in changes in teaching mannerisms among the three treatment groups?

4. Can the three remote techniques of video-phone, video-mail, and video-self-evaluation feedback supplemented with instructional models be used effectively in an inservice education program?

    a. Will the participants in all three treatment groups increase their posttest teaching performance scores over their pretest teaching performance scores?

    b. What are the reactions of the participants to the remote techniques used?

    c. What are the advantages and disadvantages of the techniques as seen by the teacher educator?

## SIGNIFICANCE OF THE PROBLEM

Due to the incalculable worth of the product of vocational education--the student--every conceivable means must be employed to insure that educational methodology contributes to the development of that product. It is believed that artful teachers who employ the most effective techniques and procedures of teaching can make a definite contribution to the development of the student. However, if the teacher is to be able to use the best techniques to improve teaching effectiveness, it becomes essential that he receive an adequate program of teacher education.

Unlike the majority of general education teachers who obtain their subject matter competency through formal education, many vocational-technical teachers acquire their subject matter competency through industrial experience. In addition, the teacher education pattern for vocational-technical teachers from the areas of trade and industrial education, health occupations education, and technical education has been limited typically to a preservice workshop followed by an inservice education program. The preservice workshops vary from three days to eight weeks in length and usually are given during the summer before the new teachers begin teaching in the fall. The inservice programs vary greatly from state to state, but are generally provided for the first four years after a new teacher is hired.

Because of the uniqueness of the background preparation of the vocational-technical teacher that was discussed above, it is apparent that many difficulties are experienced in providing effective teacher education for the beginning teachers. The application of micro-teaching through inservice education shows promise for helping these teachers learn pedagogical skills. Because of the obstacles of distance and terrain in the mountainous states of the western part of the United States, teacher educators are handicapped in their efforts to provide effective inservice education programs. Remote techniques of teacher education using video recordings show promise for spanning the obstacles of distance and terrain but little research has been conducted to assess the feasibility of these techniques in practical situations. Remote techniques such as instructional videotapes (Kallenback, 1969; Meier and Brudenell, 1968) tele-supervision (Dalrymple and White, 1967) have been tested in limited situations but no experimental research has been conducted on the combination of these techniques in an inservice program. Three laboratory experiments have been conducted at The Center for Vocational and Technical Education to develop remote techniques. The application of these techniques in a field test was the basis for this study.

## ASSUMPTIONS AND LIMITATIONS

The major assumption made in regard to this study was that as a vocational teacher's performance on specific teaching skills becomes more effective, student learning is enhanced. Another assumption was that a panel of two experienced state supervisors could evaluate teaching performance on selected skills by viewing a video recording of a teacher's performance. In addition, it was assumed that satisfaction with the three techniques of teacher education could be obtained on a nine-point satisfaction rating scale.

A significant limitation of the study was the size of the population. The study was limited to the population of beginning vocational-technical teachers in Colorado who had access to either one-half inch Sony or one inch Ampex video recording equipment. In addition, no distinction was made between high school and post-high school teachers in the analysis of data.

## RELATED RESEARCH

Reported research related to the application of micro-teaching and remote teacher education techniques to inservice vocational-technical education was meager. Most of the research reported was concerned with the application of micro-teaching to the preservice education of teachers for general secondary and elementary education. However, ongoing research at The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, has been concerned with both micro-teaching and remote supervisory techniques and their application to vocational and technical teacher education.

The research studies reviewed for this present study were divided into the following four topics: 1) applications of micro-teaching, 2) video recordings and other feedback variables, 3) modeling research, and 4) remote techniques of supervision and teacher education.

### APPLICATIONS OF MICRO-TEACHING

Several pertinent studies in the areas of preservice education for elementary teachers and preservice education for teachers of secondary general education indicated that micro-teaching with or without videotape recordings could be used effectively in preparing prospective teachers. The first studies completed on the application of micro-teaching were conducted in the preservice program for teachers of general education at Stanford University (Allen and Fortune, 1964). The findings of these studies indicated that teaching performance in the micro-teaching situation accurately predicted subsequent classroom performance and that intern teachers receiving micro-teaching experience significantly improved their performance on six specific teaching skills.

A study on the application of micro-teaching to inservice training for experienced teachers of general education was conducted at Brigham Young University (Webb and Baird, 1967: 27-31). The findings of this study indicated that after the initial threat of micro-teaching and facing the camera has passed, experienced teachers improved rapidly in achieving a discriminable skill.

Three studies on the use of micro-teaching for training prospective teachers of elementary education demonstrated the benefit of this technique. Kallenback (1968) conducted a study at San Jose State College which indicated that teachers experiencing micro-teaching performed as well as teachers receiving the traditional training. However, the teachers experiencing micro-teaching spent 80 percent less time in teaching activities. A study by Goodking (1968) and one by Davis and Smoot (1968) resulted in findings similar to Kallenback's. They also found that the use of videotape playback of the micro-lesson further strengthened the benefits obtained from micro-teaching.

## VIDEO RECORDING AND OTHER FEEDBACK VARIABLES

A review of research on teacher education has shown that much effort has been made to provide more and better feedback to prospective and experienced teachers on their performance on pedagogical skills. Tintera (n.d.) conducted one of the first experiments designed to assess the effectiveness of video and audio recordings as feedback tools in a preservice education program for elementary teachers. Results indicated there were no significant differences between the teaching performances of the students who had audio and video recordings available to them and those who received only supervisory critique. After six months of professional training, those teachers trained with the aid of kinescope and audio recordings performed significantly better than the control group. Another study of a similar nature was conducted by Schueler and Gold (1964). They gathered only qualitative data which indicated that kinescope recordings were beneficial.

Olivero (1964) conducted an experiment with prospective teachers of general education which involved the direct use of video recordings. Results of this investigation revealed that trainees who had the opportunity to view video recordings of their performance and to receive verbal feedback from supervisors made greater changes in all behaviors analyzed. Acheson (1964) in a similar study arrived at the same conclusion as Olivero.

A study conducted by the United States Air Force concluded that with video recording feedback a beginning instructor could identify his own weakness as well as an expert (King, 1968).

Most of the research on the application of video recordings in teacher education has been conducted in the areas of elementary and secondary general education. Perlberg, Tinkham and Nelson (1968) conducted one of the first studies in the area of vocational and technical teacher education. The major purpose of this study was to determine the feasibility of using video recordings in both preservice and inservice settings in Illinois. The researchers concerned themselves only with the gathering of qualitative data on a small number of student teachers. However, the results of the study did illustrate that both student teachers and experienced teachers could benefit from using video recordings for self-evaluation.

## MODELING RESEARCH

From the five research reports on the use of teaching skill models in teacher education, the following significant findings were derived:

1. Prompting and providing practice proved to be the most effective way of focusing an individual's attention to the specific teaching behaviors being modeled (Johnson, 1966).
2. Perceptual models (transmitting desired behaviors to the teacher by means of a filmed or videotaped model which portrayed the desired behavior) proved to be more effective for instructing teachers on a teaching skill than symbolic models (transmitting desired behaviors to a teacher by means of written or verbal instructions) (Orme, 1966).
3. Viewing both one's own performance and a recorded model's performance on film or videotape in the presence of a supervisor who provided discrimination training on what to look for was more effective than viewing the modeled performance alone (Orme, 1966).
4. Presenting a brief example of a specific teaching behavior taken out of context of a lesson was found to be more effective for instructing teachers in a teaching skill than presenting the behaviors in a lesson context. However, the combination of brief examples and a complete lesson demonstration was more effective for some behaviors (Young, 1967).

5. Combinations of modeling protocols which provided teachers with both reinforcement and discrimination training proved to be the most effective types of models used (Young, 1969; Orme, 1966; and Kallenback, 1969).

## REMOTE TECHNIQUES OF SUPERVISION AND TEACHER EDUCATION

One of the first pilot studies to involve the use of remote supervisory techniques was conducted in Wisconsin (Dalrymple and White, 1965). The experiment was conducted in home economics education and the effectiveness of university-directed supervision via telephone was studied. Only two student teacher subjects were involved but the subjective evidence gathered indicated that tele-supervision was possible and feasible for supervising student teachers. A later pilot study in Wisconsin, involving four experimental and four control student teachers provided further support of the feasibility of using tele-supervision (Dalrymple and White, 1967).

Meier and Brudenell (1968) conducted a descriptive study in which a combination of remote teacher education techniques was used. This study involved 92 early childhood educators from seven states. Written instructions, 16 mm sound and color films, and video recordings were used. Teachers were instructed to read the instructions, to view the 16 mm model films, and to videotape one of their own teaching sessions. Teachers critiqued their own videotaped sessions and also received mailed critiques from the research staff. The qualitative results of the study indicated that trainees who completed the entire course were more amenable to change, more highly motivated to improve their classroom practices, and more receptive to the responsive environment notions than the trainees who dropped out.

In addition to the preceding studies, three laboratory experiments were conducted at The Center for Vocational and Technical Education to determine the feasibility of using audio feedback, instructional video models, video recordings with second track audio feedback and three and seven days of delayed feedback by video recordings to help teachers improve their teaching performances (Cotrell and Doty, 1970, 1970a, and 1970b). In these experiments, all the techniques tested helped teachers improve their performance, however, no one technique was more effective than another.

Another study conducted at The Center assessed the effects of using telephone feedback supplemented with video recordings or audio recordings in vocational home economics student teaching (Smith, 1970). An analysis of measured teaching performances revealed no significant differences in teaching performances of student teachers receiving face-to-face supervision, video-phone supervision or audio-phone supervision. However, teachers in all groups made improvements in their teaching performance.

This study was conducted to determine the effectiveness of remote techniques in an inservice application of procedures developed in previous experiments at The Center.

# CHAPTER II

# DESIGN AND CONDUCT OF THE STUDY

During the Fall of 1968 contacts were made with several state leaders of vocational and technical education to determine the availability of videotape recording equipment within their respective states. In addition, the interest of vocational-technical educators in field testing the application of micro-teaching and remote techniques of inservice teacher education was determined. From the list of states expressing an interest in the study, the State of Colorado was selected. In Colorado videotape recording equipment was readily available in many of the high schools and junior colleges offering vocational and technical programs. Moreover, the State of Colorado had a unique problem of distance and mountainous terrain that limited the teacher educator's ability to make regular visits to help beginning teachers. Therefore, this situation provided the opportunity to test remote teacher education techniques under realistic conditions.

Since this study was a cooperative venture by The Center and Colorado State University, Ft. Collins, Colorado, Dr. Ronald E. Glenn, associate professor, Department of Vocational Education for the cooperating institution, agreed to serve as teacher educator and co-investigator for the experiment. Dr. Glenn met with the project investigators first in February, 1969 and again in March, 1969 to review the proposal for the study. At these meetings the proposal was revised and the narrations for the instructional models were recorded. Final plans for conducting the experiment were completed in March, 1969.

## POPULATION AND SAMPLE

During February, 1969 Dr. Glenn surveyed the beginning vocational-technical teachers (vocational-technical teachers with less than three years of teaching experience) in Colorado to determine their accessibility to one-half inch Sony or one inch Ampex video recording equipment. This procedure was followed to insure the equipment used would be compatible with that available at Colorado State University. The survey indicated that 57 teachers with less than three years of teaching experience had access to the desired recording equipment. These vocational-technical teachers were from the areas of health occupations education, trade and industrial education, and technical education. From this population, a sample of 39 teachers was randomly selected and assigned to three treatment groups (video-phone feedback, video-mail feedback, and video-self-evaluation feedback) of 13 teachers each. A table of random numbers was used to make the selection and assignment of participants.

The average age, the years of vocational, industrial, military and other teaching experience, the years of occupational experience, and the level of formal education of the participants selected for each treatment group are presented in Table A in Appendix A. The average years of other teaching experience refers to experience in teaching hobby courses, general education courses and elementary or junior high school courses.

## EXPERIMENTAL DESIGN

The experimental design selected for this study was *The Pretest-Posttest Control Group Design* (Campbell and Stanley, 1963). A diagrammatic illustration of the design is shown in Figure 1.

As can be seen from the diagram on the following page, the pretest-posttest control design used in this study did not include a true control group. Since this experiment was conducted within the framework of an ongoing inservice training program the design had to be modified to provide some instruction to all participants. Therefore, the simulated control group received the same instructions as the other groups. However, the teachers in the control group received no feedback from the teacher educator.

An illustration showing the functional operation of the experimental design is given in Figure 2. This illustration gives a brief summary of how the experimental design was put into operation.

## DESCRIPTION OF TREATMENTS

As previously mentioned, three different experimental treatments were used in this study. The treatments were similar in nature since each involved the use of videotaped instructional models, i.e., videotaped models consisting of narration and videotaped illustrations of specific behaviors of a teaching skill; illustration models, i.e., videotaped models taken from a portion of a five-minute lesson which showed one teacher performing a specific teaching skill; micro-teaching, videotaping of micro-lessons and self-evaluation of teaching performance. Thus, the treatments differed in the type of feedback received from the teacher educator.

$$\begin{array}{ccccc} R & O_1 & X_1 & O_2 & O_3 \\ R & O_4 & X_2 & O_5 & O_6 \\ R & O_7 & X_3 & O_8 & O_9 \end{array}$$

$R$ - Random selection and assignment of participants within a limited population

$O_1$ $O_4$ $O_7$ - Pretest of teacher's performance on the selected teaching skills and on teaching mannerisms

$O_2$ $O_5$ $O_8$ - Posttest of teacher's performance on the selected teaching skills and on teaching mannerisms

$O_3$ $O_6$ $O_9$ - Posttest of level of expressed teacher satisfaction

$X_1$ - Treatment one: Instructional model with video-phone feedback

$X_2$ - Treatment two: Instructional model with video-mail feedback

$X_3$ - Treatment three: Instructional model with video-self-evaluation feedback (simulated control group)

Figure 1. Schematic Diagram of the Experimental Design.

| Sample | Assignment | Co-Variable | Treatment Group | Treatment | Teaching Skills | Dependent Variables |
|---|---|---|---|---|---|---|
| Thirty-nine Teachers Selected at Random from a Population of Fifty-seven | Participants Were Assigned Randomly to Treatment Groups | Pretest Scores on the Three Teaching Skills | I Video-Phone Feedback | View Instructional Model, Critique Self, Receive Feedback from Teacher Educator via Telephone | Introducing a Lesson, Questioning and Demonstrating a Manipulative Skill | Posttest Scores on the Three Teaching Skills, Satisfaction Scale and Teaching Mannerisms |
|  |  |  | II Video-Mail Feedback | View Instructional Model, Critique Self, Receive Feedback from Teacher Educator via Mailed Videotaped Comments |  |  |
|  |  |  | III Video-Self-Evaluation Feedback | View Instructional Model and Critique Self |  |  |

Figure 2. Functional Operation of the Experimental Design.

Treatment number one, instructional model with video-phone feedback, involved 13 teachers who received feedback on their videotaped lessons via telephone conferences with the teacher educator. The teacher educator first mailed videotaped instructional models and illustration models of a teaching skill and written instructions for their use to each teacher. Each teacher viewed the instructional model as many times as he felt necessary to learn the behaviors of a particular teaching skill. Next, each teacher planned a five-minute lesson and taught it to four students. In this lesson which was videotaped, the teaching skill being studied was emphasized. Each teacher replayed his videotaped lesson and critiqued his own performance with the aid of a self-evaluation instrument (Appendix B) that was provided by the teacher educator. The evaluation instrument and the videotape were mailed to the teacher educator. The teacher educator reviewed the videotape and critiqued the lesson. The videotape was then mailed back to the teacher and the teacher had an opportunity to review his own performance.

As soon as the teacher received his videotape, a telephone conference was scheduled with the teacher educator. During the conference, the weaknesses and strengths of the teacher's performance were discussed. After the conference, the teacher viewed one or more illustration models, reviewed the teacher educator's comments, then planned and retaught the same lesson to a different group of students. This teaching-reteaching procedure was repeated for each of the three different teaching skills.

Treatment number two, instructional model with video-mail feedback, involved 13 teachers who received feedback from the teacher educator via videotaped comments which were mailed to each teacher. Each teacher in this treatment group went through the same process as the teachers in the first treatment group except each received feedback on his performance via videotape. After critiquing a teacher's videotaped lesson, the teacher educator recorded his comments on the teacher's videotape and mailed it to the teacher. Upon receiving the returned videotape, each teacher viewed his own teaching session, the teacher educator's comments on his performance and one or more illustration models; then, he planned and retaught the same lesson to a group of four students. This teaching-reteaching procedure was repeated for the three different teaching skills.

Treatment number three, instructional model with video-self-evaluation feedback, involved 13 teachers who critiqued their own lessons but received no feedback from the teacher educator. Teachers in this treatment group followed the same procedures as the teachers in the other two treatment groups except for the feedback aspect. After videotaping a teaching session and critiquing it himself, each teacher was required to present the videotape to his local supervisor who kept it for one week. The supervisor did not view the tape. This procedure of having the supervisor hold the videotape was followed to maintain a time schedule with this group similar to the schedule of the other two treatment groups. In schools that had no local supervisor, the taped lessons were mailed to the teacher educator.

After one week, the supervisor or teacher educator returned the videotaped lesson to the teacher. Then, the teacher reviewed his own critique, viewed one or more illustration models, planned and retaught the same lesson to four students. This teaching-reteaching procedure was repeated for three different teaching skills.

Figure 3 shows a comparison of the teacher activities for the three treatment groups.

## INSTRUMENTATION

### TEACHING SKILL INSTRUMENTS

Before the start of the experiment, Dr. Glenn selected three teaching skills which he believed would be of maximum benefit to the beginning teachers in his inservice teacher education program at Colorado State University. These teaching skills were: 1) introducing a lesson, 2) questioning, and 3) demonstrating a manipulative skill. The instruments (Appendix B) used for evaluating teaching performance on these three skills were adapted from instruments developed during the laboratory experiments on micro-teaching and videotape recording at The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University, Columbus, Ohio.

For evaluating teacher performance on the skill of introducing a lesson, an instrument containing nine items was used. Teacher performance on the skill of questioning was rated on an 11-item instrument. For evaluating teacher performance on the teaching skill of demonstrating a manipulative skill, a seven-item instrument was used. A six-point rating scale, i.e., 0-did not accomplish, 1-very poor, 2-poor, 3-average, 4-good, 5-excellent, was used for rating teacher performance on each item of the three instruments.

The three instruments were checked for content validity by members of the project staff at The Center for Vocational and Technical Education and by Dr. Glenn of Colorado State University. Attempts were made to make the wording simple enough that the statements of behavior for each item could be easily understood by teachers with little or no background in pedagogy.

Instructional Model with Video-Phone Feedback

| | | | | | |
|---|---|---|---|---|---|
| Teacher Views Instructional Model | Teacher Plans, Teaches, & Videotapes a Five-minute Lesson Demonstrating the Teaching Skill | Videotaped Lesson is Critiqued by Teacher, Then is Mailed to the Teacher Educator | Teacher Educator Critiques the Tape and Then Returns it to the Teacher | Teacher Educator Critiques Teacher by Phone | Teacher Views His Own Tape & the Illustration Models, Then Plans and Reteaches the Same Lesson, Cycle is Repeated |

Instructional Model with Video-Mail Feedback

| | | | | |
|---|---|---|---|---|
| Teacher Views Instructional Model | Teacher Plans, Teaches, & Videotapes a Five-minute Lesson Demonstrating the Teaching Skill | Videotaped Lesson is Critiqued by Teacher, Then is Mailed to the Teacher Educator | Teacher Educator Critiques the Tape, Records His Comments onto the Tape and Returns it to the Teacher | Teacher Views His Own Tape, Teacher Educator's Comments and the Illustration Models, Then Plans and Reteaches the Same Lesson, Cycle is Repeated |

Instructional Model with Video-Self-Evaluation Feedback

| | | | | |
|---|---|---|---|---|
| Teacher Views Instructional Model | Teacher Plans, Teaches, & Videotapes a Five-minute Lesson Demonstrating the Teaching Skill | Videotaped Lesson is Critiqued by Teacher, Then is Given to the Local Supervisor or is Mailed to the Teacher Educator | One Week Later the Local Supervisor or Teacher Educator Returns the Tape to the Teacher Without Critiquing it | Teacher Reviews His Own Critique and Tape, Then Plans and Reteaches the Same Lesson, Cycle is Repeated |

Figure 3. Operational Description of Treatments.

In previous laboratory experiments at The Center, rater reliability checks were made on each of the evaluation instruments used in this study. Inter-rater reliability correlation coefficients of at least .90 were obtained on all the instruments. Winer's formula (Winer, 1962) for using an analysis of variance to estimate rater reliability was used.

For this study an item analysis was made for each of the instruments and a rater reliability check was made on each. The "Simple Item Analysis" computer program by Goode (1967) was used to test the reliability of each of the evaluation instruments as well as each item on the instruments.

An item analysis was conducted on both the pretest and posttest scores for the evaluation instrument on introducing a lesson. As a total instrument, the reliability coefficient computed from the mean scores of the two panel members' ratings for all participants' pretest scores was .90 and for the posttest scores was .70. The pretest and posttest means, standard deviations and reliability coefficients for each item as well as the reliability correlation coefficient for the total instrument are given in Tables B and C in Appendix A.

An item analysis was made for both the pretest and posttest scores for the evaluation instrument on questioning. The pretest and posttest means, standard deviations, variances, and reliability coefficients for each item as well as the reliability coefficient for the total instrument are reported in Table D in Appendix A. The same information for the posttest scores is shown in Table E. As a total instrument, the reliability coefficients computed from the mean scores of the two panel members' ratings for all participants' pretest and posttest scores were .92 and .96 respectively.

An item analysis was utilized on both the pretest and posttest scores for the evaluation instrument on demonstrating a manipulative skill. As a total instrument, the reliability coefficients computed from the mean scores of the two panel member's ratings for all participants' pretest and posttest scores were .97 and .98. See Tables F and G in Appendix A for details.

In summary, the reliability correlation coefficients for the three critique forms were .90 or above except for the reliability correlation coefficient on the posttest scores for introducing a lesson. However, it was decided that .70 reliability correlation coefficient would be acceptable for the use for which the instrument was designed.

Examples of the three instruments used in the study are included in Appendix B. A slight variation of these instruments was given to each participating teacher in the three treatment groups to be used as self-evaluation instruments. These modified instruments were written in terms of "you" instead of "the teacher."

## INSTRUMENT ON MANNERISMS

A 10-item instrument (Appendix C) was designed to assess the changes that teachers made in their use of particular speech habits, styles of presentation and other personal teaching characteristics. Several videotaped sessions completed in earlier experiments at The Center were viewed for the purpose of selecting mannerisms that appeared to be present in the teaching performances of inexperienced teachers. No attempt was made to determine the negative or positive nature of the mannerisms, the instrument was designed merely to indicate if teachers did or did not exhibit certain mannerisms.

## SATISFACTION SCALE

The satisfaction scale used for obtaining expressed teacher satisfaction with the remote teacher education techniques was adapted from a satisfaction scale used in a previous experiment at The Center. Thirty-two statements composed of 16 positive and 16 negative statements were written to obtain the degree of teacher satisfaction with the remote teacher education techniques used. The content validity of the statements was obtained by soliciting reactions from several teacher educators in regard to clearness of statement and pertinence to this study. In addition, six teachers of vocational-technical education representing six trade areas read and reacted to the wording of the statements. After changes were made, the negative and positive items were assigned a number from one to 32 and were placed in a random order for recording on the satisfaction scale.

A nine-point scale was used for rating each statement on the satisfaction scale. The nine points provided a scale starting with 1 (strongly disagree) to 9 (strongly agree). A copy of the satisfaction instrument is included in Appendix D.

## QUESTIONNAIRE

A reaction questionnaire was used to obtain the reactions of the participating teachers in regard to the number of times each of the models was viewed and to assess the strengths and weaknesses of the three techniques of teacher education as seen through the eyes of the participants. In addition, information on the characteristics of the participants in each treatment group was obtained. The items from this instrument are presented in Chapter III.

## INSTRUCTIONAL AND ILLUSTRATION MODELS

One videotaped instructional model for each of the three teaching skills used in this experiment was developed at The Center prior to beginning the experiment. The following procedures were followed in developing each of the instructional models:

1. Videotaped teaching performance from previous experiments completed at The Center were analyzed to identify videotape segments which illustrated satisfactory teacher performance of each of the behaviors identified for a teaching skill.

2. A narrative script which identified the skill and introduced each illustrative film segment for the specific behaviors was written.

3. Dr. Glenn acted as narrator and was videotaped reading the script describing the skill and the individual teaching behaviors included in the skill.

4. The narrator's comments and the selected illustrative videotape segments were dubbed onto one tape; thus, integrating them into one concise instructional tape.

5. To complete the instructional model, an illustration model was added to provide practice on rating the specific teaching skill. Narration of ratings given the illustration model was added to provide for comparison of viewer ratings against a standard.

6. The completed instructional model, consisting of narration, illustrative film segments of teaching behaviors, and an illustration model, was dubbed onto both one-half inch videotapes and one inch videotapes for distribution to the participants.

Illustration models were selected from videotaped teaching performances that had been recorded during previous experiments at The Center. Two members of the project staff reviewed the tapes and selected three representative teaching performances for each of the teaching skills. These illustration models were dubbed onto one videotape and ratings of the models were written to serve as guides to teachers viewing them. This videotape with nine illustration models served as a source from which the teacher educator could select an illustration model that would be most appropriate for a given teacher.

## CONDUCT OF THE EXPERIMENT

The 39 participants were pretested during the first week of April, 1969. Dr. Ronald E. Glenn traveled to the school of each participating teacher and videotaped the teacher presenting a five-minute lesson to four students. After the pretest, all participants were given a handout which explained what the experiment would include.

The actual experiment began the second week of April, 1969. A videotape containing the nine illustration models (three models for each skill) and a videotape containing the first instructional model on introducing a lesson were sent to each high school or junior college that had teachers who participated in the study. In addition, each teacher was sent a new videotape for recording his teaching sessions, written instructions on how to use the model, a schedule of events for the entire experiment, and three copies of the evaluation instrument on introducing a lesson.

Each teacher studied the instructional model, videotaped a micro-teaching session in which the teaching skill of introducing a lesson was practiced, and critiqued his own lesson. The videotaped lesson was sent to the teacher educator who administered one of the three remote feedback techniques, i.e., video-phone feedback, video-mail feedback, or video-self-evaluation feedback. The teacher then planned and retaught the lesson, again, practicing the skill of introducing a lesson. The teaching-reteaching cycle was repeated for two other skills: 1) questioning and 2) demonstrating a manipulative skill.

Dr. Glenn served as teacher educator for all of the treatment groups. Two weeks were required for the teachers to experience each teaching skill, but this time varied from three to five days because of mailing distances and problems in scheduling video recording equipment. As a result, the experiment lasted eight weeks instead of the planned six weeks.

During the first week of June, 1969 the 36 participants who remained in the program throughout the experiment were posttested. One teacher from each treatment group failed to complete all phases of the experiment.

Immediately after being posttested each teacher was asked to indicate his level of satisfaction with the remote teacher education technique to which he was exposed. A satisfaction scale containing 32 statements was used. In addition, a questionnaire was completed by each teacher to obtain the reactions of the participants in regard to the number of times each of the models was viewed and also to provide a means for assessing the strengths and weaknesses of the three remote techniques of teacher education.

## CONTROLS USED IN THE EXPERIMENT

In addition to the controls for internal validity which were provided by the experimental design, several physical controls were incorporated by the investigator. These controls were as follows:

1. All participants were given orientation instructions via a videotape recording prior to being pretested. The orientation instruction consisted of a brief explanation of micro-teaching, an example of a videotaped five-minute lesson, and instructions telling the participants that they would be given one hour to plan a five-minute lesson in which they were to demonstrate their ability to introduce a lesson, question students, and demonstrate a manipulative skill.

2. All participants were given the opportunity to view the instructional and illustration models as many times as they desired.

3. All participants taught six five-minute lessons (two lessons for each teaching skill) and critiqued their own lesson.

4. One teacher educator served all teachers in the experiment. In addition, the critique sessions for the two treatment groups receiving feedback were of approximately the same time limit of five minutes each.

5. Efforts were made to keep all participants on a rigid schedule. However, due to equipment failures and delays in mail deliveries from different parts of the state, the time schedules for certain individuals in all treatment groups varied during the experiment.

6. The pretest and posttest teaching sessions were rated by two panel members who had no previous contacts with the participants.

7. Pretest and posttest videotaped teaching sessions were viewed in a random order using the "double-blind" technique to prevent a teacher from being rated on his pretest and posttest in sequence.

## RATER RELIABILITY

After the posttest teaching sessions had been videotaped, two panel members were selected to rate the pretests and posttests of each teacher included in the study. The qualifications established for selection of each panel member were as follows: 1) a minimum of a master's degree in education, 2) supervision and teacher education experience in vocational education, and 3) current employment in the area of vocational education. Two state supervisors who met these qualifications were engaged and scheduled for an orientation session on June 11, 1969.

The two-member panel was given a six-hour orientation on using the rating instruments to evaluate performance on the three teaching skills. Details of the orientation and rating procedures are presented in Appendix E.

Inter-rater reliability correlation coefficients for the panel members were calculated for both the pretests and the posttests for each of the three evaluation instruments used. Winer's formula for using analysis of variance to test the reliability of raters was used. The inter-rater reliability coefficients for the pretest and the posttest of each instrument were as follows:

1. Introducing a lesson--pretest .91 and posttest .96.
2. Questioning--pretest .97 and posttest .98.
3. Demonstrating a manipulative skill--pretest 1.00 and .98.

Since the rater reliability measurements for all instruments were .91 or above, it can be seen that the reliability of the two raters was consistently high.

## ANALYSIS OF DATA

All of the data collected in this study, except for the questionnaire data, was analyzed by the use of a computer. The Biomedical Computer Program (BMDO4V) as adapted for the IBM 360 computer was selected for the one-way analysis of covariance run on the teaching performance data. The BMDO4V program provided the following output: 1) an analysis-of-covariance table with degrees of freedom, sums of squares, mean squares, and F ratio; 2) tables of regression coefficients, their standard errors and computed t-values with and without adjustment for groups; and 3) a table of adjusted means and their standard errors (Dixon, 1967).

For the analysis of variance on the satisfaction data, the BMDO1V program for the IBM 360 computer was used. This program provided an output of a complete analysis-of-variance table with an F ratio.

In addition to the use of the computer described in the preceding discussion, the item analysis for each critique form and the analysis of variance for the rater reliability measurements were obtained from computer output. For the item analysis, the IBM 1620 computer was used and for the rater reliability measurement, an analysis of variance using the BMDO2V for the IBM 7094 computer was used.

# CHAPTER III

# PRESENTATION AND INTERPRETATION OF FINDINGS

The major purpose of this study was to determine the effectiveness of three remote techniques of teacher education for providing inservice education on three selected teaching skills. In order to accomplish the purpose, answers to the following research questions were sought:

1. Which of the three techniques of remote teacher education (video-phone, video-mail or video-self-evaluation) will result in the greatest improvement in teaching performance on the following three teaching skills?

    ($Q_1$) as a composite score and each skill separately,
    ($Q_2$) introducing a lesson,
    ($Q_3$) questioning,
    ($Q_4$) demonstrating a manipulative skill.

2. ($Q_5$) Are there significant differences in the level of expressed teacher satisfaction among the treatment groups?

3. ($Q_6$) Are there significant differences in positive changes in teaching mannerisms among the three treatment groups?

4. ($Q_7$) Can the three remote techniques of video-phone feedback, video-mail feedback, and video-self-evaluation feedback be used effectively in an inservice education program?

## ANALYSIS OF THE EFFECTIVENESS OF THE THREE REMOTE TECHNIQUES IN REGARD TO TEACHER PERFORMANCE

To answer the first four research questions concerning the effectiveness of the three remote techniques on teaching performance for the teaching skills of introducing a lesson, questioning, and demonstrating a manipulative skill, four null hypotheses were formulated and tested. A one-way analysis of covariance was used to test the hypotheses at the .05 level of significance for the composite scores on the three teaching skills as well as on each individual skill. The pretest performance scores were used as the covariates. The raw performance score for each teacher was obtained by calculating the mean scores from the two panel members' individual scores for each teaching skill. The total maximum raw score that an individual teacher could obtain on the composite of the three skills was 135. The maximum score for the skill of introducing a lesson was 45, and the maximum scores for the skills of questioning and demonstrating a manipulative skill were 55 and 35 respectively.

## TOTAL PERFORMANCE

There were no statistically significant differences in total teaching performances on the three teaching skills among the treatment groups. The resulting F ratio of .32 with 2 and 32 degrees of freedom was interpreted to mean there was no greater variation between groups than within groups (see Table H in Appendix A). On the basis of the calculated F ratio, it was concluded that there was no significant difference in the total teaching performance of the three treatment groups on the three skills.

## PERFORMANCE ON THE TEACHING SKILL OF INTRODUCING A LESSON

The first teaching skill presented to each teacher in the three treatment groups was introducing a lesson. An analysis of the data revealed that there were no statistically significant differences in teaching performances on this skill among the three treatment groups. The F ratio of .14 with 2 and 32 degrees of freedom shown in Table I in Appendix A indicated that differences within the groups were as great as the differences between the groups. On the basis of the analysis, the answer to question two ($Q_2$) was--the teachers in the three treatment groups did not differ significantly in their teaching performance on the skill of introducing a lesson.

## PERFORMANCE ON THE TEACHING SKILL OF QUESTIONING

The second teaching skill studied by each teacher in the three treatment groups was questioning. An analysis of the data obtained from a one-way analysis of covariance revealed a non-significant F ratio among the treatment groups. The F ratio of .46 with 2 and 32 degrees of freedom shown in Table J in Appendix A was not significant. The answer to question three ($Q_3$) was--the teachers in the three treatment groups did not differ significantly in their performance on the teaching skill of questioning.

## PERFORMANCE ON THE TEACHING SKILL OF DEMONSTRATING A MANIPULATIVE SKILL

The third and final teaching skill studied by each teacher in the three treatment groups was demonstrating a manipulative skill. For this skill the F value of 1.60 with 2 and 32 degrees of freedom shown in Table K in Appendix A was not significant. The answer to question four ($Q_4$) was--the teachers in the three treatment groups did not differ significantly in their performance on demonstrating a manipulative skill.

## DISCUSSION OF THE FINDINGS ON TEACHING PERFORMANCE

In considering why there were no statistically significant differences among the three groups on teaching performance, the following points should be noted:

1. Teachers in all treatment groups had an opportunity to view instructional and illustration models on each teaching skill.
2. All participants had the opportunity to critique themselves using a self-critique form.
3. A comparison of the average number of viewing times on the instructional models showed that the video-mail and the video-self-evaluation groups viewed the models slightly more than the video-phone group.
4. Although teachers in each group increased their posttest scores over their pretest scores, no group was able to score over one-half the maximum possible score on any skill.
5. Teachers taught only two teaching sessions for each skill.

When the above five points are considered, it can be rationalized that in the short inservice training program, such as was the case in this study, feedback from the teacher educator would not have had much effect. Since the teachers had an opportunity to teach only two lessons on each skill, the feedback on these two lessons would have done little more than confirm what the teachers could tell from their own critiques. This idea is supported by the finding of King (1968) who found that on a student's first lesson, the student could identify his own weaknesses as well as an expert.

Another important point is the fact that the teachers in the video-mail and the video-self-evaluation groups viewed the instructional models on the average more than the teachers in the video-phone group. This factor could possibly have offset the advantage of person-to-person feedback via telephone.

## ANALYSIS OF THE LEVEL OF EXPRESSED TEACHER SATISFACTION WITH THE REMOTE TECHNIQUES

To answer the question, "Are there significant differences in the levels of expressed teacher satisfaction among the three treatment groups?" ($Q_5$), an analysis of variance on the satisfaction data was computed. The raw score for each teacher was obtained by adding the scores from the 32 item instrument. The total maximum raw score that an individual teacher could obtain on the Satisfaction Scale was 288.

An examination of the data presented in Table L in Appendix A revealed that there were no statistically significant differences among the three treatment groups on the expressed level of satisfaction. The calaculated F value of .94 with 2 and 33 degrees of freedom indicated no significant difference among the treatment groups.

## DISCUSSION OF THE FINDINGS ON TEACHER SATISFACTION

In analyzing why there were no statistically significant differences in the levels of expressed satisfaction with the technique used, the following points should be considered:

1. The teachers enrolled in this inservice program had little prior opportunity to learn what was expected of them in regard to effective teaching. Therefore, they could have been impressed with the videotaped instructional illustration models which demonstrated some effective teaching behaviors.
2. The summary of the comments by all teachers indicated this was the first time they had been given assistance in self-evaluation.

Because of the above two points, it is understandable that the mean satisfaction rating for each group was similar. Although the teachers in the video-self-evaluation group did not express as high a level as the ones in the other two groups, they indicated that they were satisfied with the improvement in their teaching performance.

## CHANGES IN TEACHER MANNERISMS

Although the participants were given no instructions on teaching mannerisms, it was evident that some changes were being made in regard to the mannerisms. For this reason the following research question was asked: "Are there significant differences in positive changes (increase in frequency of positive use) of teaching mannerisms among the three treatment groups?" ($Q_6$). To answer this question a chi-square ($X_2$) test was computed to identify if there were differences among the treatment groups on changes in mannerisms. The calculated value of chi-square was 11.08 which was significant at the .01 level. Data on the changes are reported in Table 1.

TABLE I

CHANGES IN TEACHING MANNERISMS

| Treatment | Number of Changes from Pretest to Posttest: Accomplished To Did Not Accomplish | Did Not Accomplish To Accomplished |
|---|---|---|
| Video-phone | 5.5 | 5.0 |
| Video-mail | 0.0 | 12.5 |
| Video-self-evaluation | 2.0 | 14.5 |

Calculated $X^2 = 11.08$ $X^2(.01) = 9.21$ with 2 degrees of freedom

Since a significant difference was found among the three groups with regard to changes in teaching mannerisms, comparisons were made among the groups to identify the specific difference. The chi-square test results given in Table 2 showed that there was a significant difference between the video-phone and video-mail groups at the .01 level of significance. There was also a difference between the video-phone and the video-self-evaluation groups at the .05 level of significance. There was no significant difference between the video-mail and video-self-evaluation groups.

## TABLE 2

## COMPARISON OF CHANGES IN TEACHING MANNERISMS

| Treatment Comparison | $X^2$ |
|---|---|
| Video-phone vs. video-mail | 8.64** |
| Video-phone vs. video-self-evaluation | 5.17* |
| Video-mail vs. video-self-evaluation | 2.50 |

$X^2(.05) = 3.84$ with 1 degree of freedom
$X^2(.01) = 6.64$ with 1 degree of freedom
*Significant at .05 level
**Significant at .01 level

To determine direction of significant differences shown in Table 2, a McNemar test for significance of change was computed between pretest and posttest changes for each treatment group. As shown in Table 3, there was no significant difference in pretest to posttest changes for the video-phone group. For the video-mail group there was a significant change in the frequency with which teachers made positive use of mannerisms between pretest and posttest teaching performance. For the video-self-evaluation the change in the frequency with which teachers made positive use of teaching mannerisms was significant at the .01 level.

## TABLE 3

## DIFFERENCES IN CHANGES IN MANNERISMS

## WITHIN TREATMENT GROUPS

| | Number of Changes from Pretest and Posttest | | |
|---|---|---|---|
| Treatment | Accomplished To Did Not Accomplish | Did Not Accomplish To Accomplished | $X^2$ |
| Video-phone | 5.5 | 5.0 | .01 |
| Video-mail | 0.0 | 12.5 | 12.50*** |
| Video-self-evaluation | 2.0 | 14.5 | 9.47** |

Continued

Table 3 Continued
$X^2(.01) = 6.64$ with 1 degree of freedom
$X^2(.001) = 10.83$ with 1 degree of freedom
**Significant at the .01 level
***Significant at the .001 level

In summary, there were changes in teaching mannerisms among the treatment groups although no instruction on mannerisms was presented. The video-mail and the video-self-evaluation groups improved their teaching mannerisms significantly while the teachers in the video-phone group failed to improve their teaching mannerisms.

### DISCUSSION OF FINDINGS ON TEACHING MANNERISMS

Some possible reasons for the video-mail and the video-self-evaluation groups making more positive changes in teaching mannerisms than the video-phone group are suggested as follows:

1. The teachers in the video-mail group received their feedback on videotape and, therefore, had an opportunity to view their own performance immediately before and after reviewing the teacher educator's comments.

2. The video-self-evaluation group received only self-evaluation feedback and the teachers in this group reviewed their own tapes many times.

3. The teachers in the video-phone group received feedback via telephone and by having this verbal exchange with the teacher educator, their attention was focused more acutely on their performance of the teaching skill.

Further, it is suggested that since the video-phone group received more concentrated feedback on teaching skills, the teachers in this group did not concern themselves with their mannerisms. Since the other two groups had no verbal exchange with the teacher educator, it can be theorized that they had a tendency to look at their performances in terms of how their image was projected during the videotaped sessions as well as how they performed the teaching skill being studied. Therefore, these teachers may have refrained from exhibiting mannerisms that appeared to detract from their projected image.

## ANALYSIS OF DATA ASSESSING THE FEASIBILITY OF REMOTE TECHNIQUES OF TEACHER EDUCATION

To provide some evidence of the feasibility of each of the three types of remote techniques used in this study, a paired t-test was calculated between the pretest and posttest scores for each teaching skill within each treatment group. This procedure was followed to determine if each group was able to make significant changes in teaching performance from pretest to posttest.

A questionnaire was utilized to obtain the reactions of the teachers to the remote technique to which they were exposed. The comments made by the teachers provided valuable information for assessing the feasibility of each remote technique. In addition, the reactions of the teacher educator to the three remote techniques were considered.

## RESULTS OF THE PAIRED t-TESTS

Video-phone. A paired t-test between pretest and posttest scores for the video-phone group's teaching performance on the composite of the three teaching skills revealed a t value of 3.95. This t value indicated that teachers within the video-phone feedback group significantly improved their posttest scores over their pretest scores beyond the .01 level of significance. On the skill of introducing a lesson the teachers improved their teaching performance significantly beyond the .05 level of significance as shown by a calculated t value of 2.25. For the skill of questioning, a t value of 1.18 was revealed. The teachers did not significantly improve their posttest scores over their pretest scores for this skill. Since the pretest score for the teaching skill of demonstrating a manipulative skill was zero and, therefore, would not correlate with the posttest score, no t value is reported. The calculated t values are shown in Table 4.

TABLE 4

COMPARISON OF PRETEST-POSTTEST

TEACHING PERFORMANCE SCORES FOR TEACHERS RECEIVING

VIDEO-PHONE FEEDBACK

| Teaching Skill | Source of Scores | Number of Subjects | Standard Deviation | Mean Score | t |
|---|---|---|---|---|---|
| Composite of Three Skills | Pretest | 12 | 13.29 | 16.62 | 3.95** |
| | Posttest | 12 | 22.44 | 50.71 | |
| Introducing a Lesson | Pretest | 12 | 2.47 | 5.08 | 2.25* |
| | Posttest | 12 | 5.97 | 9.29 | |

Continued

Table 4 Continued

| | | | | | |
|---|---|---|---|---|---|
| Skill of Questioning | Pretest | 12 | 12.94 | 11.54 | 1.18 |
| | Posttest | 12 | 13.83 | 18.71 | |
| Demonstrating a Manipulative Skill | Pretest | 12 | 0.00 | 0.00 | ---- |
| | Posttest | 12 | 10.50 | 22.71 | |

P.05 = 2.20 (with 11 degrees of freedom)
P.01 = 3.11 (with 11 degrees of freedom)
*Significant at .05 level
**Significant at .01 level

Video-mail. A comparison was made between the pretest and posttest scores of the video-mail feedback group's teaching performances using the paired t-test. For this group a t value of 3.62 was obtained by comparing the pretest and posttest scores for the composite of the three teaching skills. This t value indicated that teachers within the video-mail feedback group significantly improved their posttest scores over their pretest scores beyond the .01 level of significance for the total program. For the skill of introducing a lesson, the teachers receiving video-mail feedback did not significantly improve their posttest scores over their pretest scores since a t value of 1.69 was obtained for this skill. In addition, a nonsignificant t value of 1.68 was revealed for the teaching skill of questioning. For the teaching skill of demonstrating a manipulative skill, a calculated t value of 3.66 indicated an improvement of posttest scores over the pretest scores beyond the .01 level of significance. The calculated t values for the video-mail feedback group's teaching performance are presented in Table 5.

TABLE 5

COMPARISON OF PRETEST-POSTTEST

TEACHING PERFORMANCE SCORES FOR TEACHERS RECEIVING

VIDEO-MAIL FEEDBACK

| Teaching Skill | Source of Scores | Number of Subjects | Standard Deviation | Mean Score | t |
|---|---|---|---|---|---|
| Composite of Three Skills | Pretest | 12 | 17.98 | 29.25 | 3.62** |
| | Posttest | 12 | 16.41 | 53.17 | |

Continued

Table 5 Continued

| | | | | | |
|---|---|---|---|---|---|
| Introducing a Lesson | Pretest | 12 | 5.79 | 7.38 | 1.69 |
| | Posttest | 12 | 5.62 | 10.96 | |
| Skill of Questioning | Pretest | 12 | 8.07 | 8.75 | 1.68 |
| | Posttest | 12 | 12.67 | 16.83 | |
| Demonstrating a Manipulative Skill | Pretest | 12 | 12.72 | 10.17 | 3.66** |
| | Posttest | 12 | 8.04 | 25.38 | |

P.01 = 3.11 (with 11 degrees of freedom)
**Significant at .01 level

Video-self-evaluation. A paired t-test between pretest and posttest scores for the video-self-evaluation group's teaching performance on the composite of the three teaching skills revealed a t value of 4.10. This t value indicated that teachers within the video-self-evaluation group significantly improved their posttest scores over their pretest scores beyond the .01 level of significance. For the skill of introducing a lesson, the teachers improved their teaching performance significantly beyond the .05 level of significance as shown by a calculated t value of 2.64. A comparison of the pretest and posttest scores on the skill of questioning revealed a t value of 3.20. This t value indicated an improvement of posttest scores over pretest scores beyond the .01 level of significance. For the teaching skill of demonstrating a manipulative skill, a calculated t value of 3.66 indicated an improvement in teaching performance beyond the .01 level of significance. The calculated t values are reported in Table 6.

TABLE 6

COMPARISON OF PRETEST-POSTTEST

TEACHING PERFORMANCE SCORES FOR TEACHERS RECEIVING

VIDEO-SELF-EVALUATION FEEDBACK

| Teaching Skill | Source of Scores | Number of Subjects | Standard Deviation | Mean Score | t |
|---|---|---|---|---|---|
| Composite of Three Skills | Pretest | 12 | 15.53 | 15.54 | 4.10** |
| | Posttest | 12 | 16.47 | 48.46 | |

Continued

Table 6 Continued

| | | | | | |
|---|---|---|---|---|---|
| Introducing a Lesson | Pretest | 12 | 1.85 | 4.50 | 2.64* |
| | Posttest | 12 | 5.47 | 9.38 | |
| Skill of Questioning | Pretest | 12 | 11.18 | 7.46 | 3.20** |
| | Posttest | 12 | 11.71 | 22.21 | |
| Demonstrating a Manipulative Skill | Pretest | 12 | 8.05 | 3.58 | 3.66** |
| | Posttest | 12 | 12.05 | 16.88 | |

P.05 = 2.20 (with 11 degrees of freedom)
P.01 = 3.11 (with 11 degrees of freedom)
*Significant at .05 level
**Significant at .01 level

## TEACHERS' REACTIONS TO THE THREE REMOTE TECHNIQUES

All participants were asked to complete a seven-question instrument about the procedures and techniques used in the in-service education program. Each of the questions on the questionnaire will be stated and a summary of the answers will be presented in this section.

Item #1: How many times did you view the following instructional models?

Times

a. How to introduce a lesson? _____

b. How to use questioning? _____

c. How to demonstrate a manipulative skill? _____

The average number of times each of the instructional models was viewed by the three treatment groups is shown in Table 7. Both the video-mail feedback group and the video-self-evaluation feedback group viewed the models more times on the average than the video-phone feedback group.

## TABLE 7

## AVERAGE VIEWING TIMES FOR THE INSTRUCTIONAL MODELS BY EACH OF THE THREE TREATMENT GROUPS

| Instructional Model | Times Viewed by Video-phone Group | Times Viewed by Video-mail Group | Times Viewed by Video-Self-Evaluation Group |
|---|---|---|---|
| Introducing a Lesson | 1.4 | 1.9 | 2.0 |
| Questioning | 1.6 | 1.8 | 1.8 |
| Demonstrating a Manipulative Skill | 1.2 | 1.4 | 1.3 |

Item #2: Did you feel that the instructional models helped you to learn the following teaching skills (circle yes or no and comment)?

a. Introduce a Lesson yes no Why or why not?

b. Questioning yes no Why or why not?

c. Demonstrating a Manipulative Skill yes no Why or why not?

All 36 of the participants indicated that the instructional model on introducing a lesson helped them to learn the skill. Thirty-three indicated that the instructional model on questioning helped them. Three participants felt the questioning model was of no help to them. Thirty-two of the participants indicated that the instructional model on demonstrating a manipulative skill helped them to learn the skill. Four indicated that the demonstration model was of no benefit in helping them to learn this skill.

The comments given by the participants in regard to why the models were helpful were very similar. Most of the participants indicated that the models provided a means by which they could see and hear how to perform each of the teaching skills. From the participants who indicated that the models had not helped them, the main complaint was that the videotape quality was poor or that the models were too artificial.

Item #3: Did the illustration models (illustrations of one teacher demonstrating the teaching skill) help you to improve your performance on the reteach sessions (circle yes or no by each skill and comment)?

a. Introduce a Lesson    yes    no    Why or why not?

b. Questioning    yes    no    Why or why not?

c. Demonstrating a Manipulative Skill    yes    no    Why or why not?

Thirty-two participants indicated that the illustration models on introducing a lesson were helpful. Four participants felt that the models were not helpful. Thirty-one participants indicated that the illustration models for the skill of questioning and demonstrating a manipulative skill were helpful. Five participants indicated that illustration models for these two skills were not helpful.

The majority of the participants indicated that the illustration models helped them by providing further reinforcement. The participants who indicated the models were not helpful expressed the idea that the models were repetitious and that the recording quality was poor.

Item #4: Did you feel that this inservice teacher education program helped you to improve your classroom teaching performance (yes or no)?

_____ if yes, what teaching skill(s) was/were improved?

Thirty-five of the 36 participants indicated that the inservice program had helped them to improve their classroom teaching performance. The one negative response given was from a participant who believed that the theory of teaching was emphasized too much.

The reactions of teachers from the three different treatment groups were similar. Most of the teachers felt that they had improved their teaching performance on the three skills studied and that their ability to prepare and organize a lesson had been improved.

Item #5: What do you consider the main advantages and disadvantages of the method of remote teacher education in which you were involved?

In summary, the main advantages of the remote techniques as expressed by the teachers in each treatment group were:

1. The teachers who received video-phone feedback emphasized the advantage of having the opportunity to discuss their teaching performances with the teacher educator.
2. The teachers who received video-mail feedback emphasized the advantages of being able to work out a flexible schedule for completing the teaching sessions and also being able to get some feedback from the teacher educator.
3. The teachers who received video-self-evaluation feedback indicated that the main advantage of their remote technique was being able to work on self-improvement at a time convenient to them.

A summary of the disadvantages given by the participants indicated the following:

1. The video-phone technique had the disadvantage of teachers not being able to make personal, face-to-face contacts with the teacher educator.
2. The video-mail technique lacked immediate feedback from the teacher educator and required more use of the videotape equipment.
3. The video-self-evaluation technique failed to provide any means for teachers to ask questions and get answers.

Item #6: If you were involved in this type of program again, what would be your suggestions for improving the method of remote teacher education in which you were involved?

A summary of the suggestions given by each treatment group was as follows:

1. The teachers who received video-phone feedback indicated that more training sessions and more detailed critiques by the teacher educator were needed.
2. The teachers who received video-mail feedback indicated that the time limit on the length of the lesson should be increased and that the teacher educator's critiques should be sent out faster.

3. The teachers who received video-self-evaluation feedback indicated that they needed feedback from the teacher educator to verify if their self-critiques were accurate.

Item #7: Would you be willing to participate in another similar inservice training program on additional teaching skills? (please circle Yes or No)

All 36 of the participants indicated that they would be willing to participate in another similar inservice program.

## REACTIONS TO THE TECHNIQUES BY THE TEACHER EDUCATOR

The comments of the teacher educator in regard to the advantages and disadvantages of the use of each of the three remote techniques gave some valuable insights into the practical application of the techniques. The teacher educator indicated that the video-phone feedback technique provided the advantages of personal contact with the teachers, an opportunity to answer the teachers' questions, and for smooth operation due to the use of a preplanned schedule. As seen by the teacher educator, the main disadvantage of the video-phone feedback technique was the delay in providing the feedback. Seven to eight days usually elapsed before the teacher's tape could be mailed to the teacher educator, critiqued, and returned so the teacher could view it again before the telephone conference.

The main advantage of the video-mail feedback technique was that it provided the teacher educator an opportunity to respond immediately to the teaching performance. Since the teacher educator recorded his comments on the tape immediately after viewing the teacher's performance, he was able to provide the critique while the observed teaching performance was still fresh on his mind. The major disadvantage of the video-mail feedback technique was that it required more use of the recording equipment which caused the teacher educator to work after normal hours in order to schedule the use of the equipment.

The video-self-evaluation feedback technique required no additional effort on the part of the teacher educator. Therefore, this technique provided an opportunity for the teacher educator to engage in other necessary activities.

# CHAPTER IV

# CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

In this chapter, the conclusions based on the findings of the study are given. In addition, recommendations and implications for application of the remote techniques are presented.

## CONCLUSIONS

The following conclusions were drawn from the findings of the study:

1. Remote feedback on teaching performance from the teacher educator via mailed videotaped comments or via telephone had no more effect on improving a teacher's performance on selected teaching skills than the feedback a teacher received from viewing models, and viewing and critiquing his own videotaped lesson. This conclusion was based on the finding of no statistically significant differences among the treatment groups on teaching performance.

2. Teacher satisfaction with the three remote techniques tested (video-phone feedback, video-mail feedback, and video-self-evaluation feedback) was not dependent upon the type of feedback each group received. This conclusion was based on the finding of no significant differences among the treatment groups on the teachers' expressed level of satisfaction with the technique used.

3. Teachers who had the opportunity of critiquing their own performances and/or viewing the teacher educator's comments via video recordings made more positive changes in teaching mannerisms than teachers who critiqued themselves and received feedback from the teacher educator via telephone. This conclusion was based on the fact that the teachers receiving video-mail feedback and those receiving video-self-evaluation feedback, made significantly more positive changes in teaching mannerisms than the teachers receiving video-phone feedback.

4. The use of remote techniques in an inservice program on teaching skills was determined to be feasible and did

help beginning teachers analyze and change their teaching behavior. This conclusion was based on the finding of teaching improvement of posttest scores over pretest scores beyond the .01 level of significance for all teachers on their total performance for the three teaching skills. In addition, the reactions of the teachers to a questionnaire indicated that a majority of the teachers believed the instructional and illustration models were helpful in directing their learning experiences.

## RECOMMENDATIONS

The main recommendation that can be made based on the conclusions of this study is for a continuation of the use of the remote techniques in the inservice program in Colorado. In continuing to use the remote techniques, the teacher educator should select the techniques he believes to be most appropriate for a given application. Recommendations for continued research and for improvement of the remote techniques are also suggested in the following paragraphs.

### FURTHER RESEARCH

In regard to further research it is recommended that:

1. Six months after the completion of the experiment, a follow-up study should be conducted to determine if there are any differences in the ability of the teachers in the three treatment groups to retain their posttest level of teaching performance on the three teaching skills.

2. A research study similar to the current study should be conducted over a period of at least six months, include a larger sample from a larger population, at least four teaching sessions per skill and compare the treatment groups' performances to a true control group. Since this present study was conducted over a short time period and the teachers had the opportunity to teach only two sessions in which each skill was emphasized, there is a need to see if the findings of this study will hold up over a longer period of time with a larger sample. Moreover, there is a need to compare the treatments to a true control group which receives only the traditional workshop experience.

3. Research should be conducted to measure the transfer of the use of the teaching skills to the normal classroom situation.

4. Efforts should be made to determine if instructions on teaching mannerisms will have any effects on the ability of teachers to learn teaching skills. To accomplish the above, a more refined instrument for measuring a teacher's use of mannerisms is needed.

## NEEDED IMPROVEMENTS IN THE REMOTE TECHNIQUES

Two basic types of improvements should be made in the remote techniques used in this study. Both of these improvements are concerned with the preparation of the materials used. The quality of the reproduced videotapes used for instructional models should be improved by using correctly adjusted videotape recording equipment when recording the duplicates. In addition to maintaining quality reproduction of instructional model tapes, complete instructional booklets which explain the use of the instructional models should be prepared and sent to each participant. The mimeographed materials used in this study were not as useful as they could have been, since the teachers did not always receive them in an organized form.

## IMPLICATIONS

The three techniques used in this study offer the following implications for use in inservice teacher education:

1. Inservice education of teachers can be varied or individualized for each teacher dependent upon his particular teaching situation.

2. Remote techniques can be used to supplement the visitations of the teacher educator or supervisor in a traditional inservice teacher education program.

3. The application of remote techniques involving video recordings offer the means whereby alternative methods of teacher education are possible.

4. The media and techniques employed in this study can be implemented in a high school, area vocational school or community college to provide a local inservice teacher education program.

5. Self-evaluation techniques provide a teacher with means by which he can continue to improve professional expertise.

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# GLOSSARY

Teaching skill of introducing a lesson. The teaching skill, consisting of nine teacher behaviors, which a teacher performs to set the stage for student participation and to inspire students to learn what is to be taught.

Teaching skill of questioning. The teaching skill, consisting of 11 teacher behaviors, by which a teacher uses questions to promote mental activity on the part of the learner by providing him an opportunity to become actively involved in the lesson.

Teaching skill of demonstrating a manipulative skill. The teaching skill, consisting of seven teacher behaviors, by which a teacher informs students how to perform a manipulative skill safely and in a step-by-step manner.

Instructional model. Videotaped instructions on a specific teaching skill which consist of descriptive narrations and filmed illustrations of specific behaviors of a teaching skill being performed by several different teachers.

Illustration model. A videotaped teaching session, approximately three minutes in length, which shows one teacher performing the specific teaching behaviors of one teaching skill.

Video-phone feedback. The combination of knowledge of performance on a teaching skill that a teacher receives from viewing his own videotaped lesson and from listening to the comments in regard to his performance from the teacher educator via telephone.

Video-mail feedback. The combination of knowledge of performance on a teaching skill that a teacher receives from viewing his own videotaped lesson and from viewing the videotaped comments in regard to the performance sent by the teacher educator via mail.

Video-self-evaluation feedback. The combination of knowledge of performance on a teaching skill that a teacher receives from viewing his own videotaped lesson and from making a self-critique of the performance with the aid of a teaching skill critique form.

Teacher educator. The person at the university who is responsible for providing inservice training on teaching skills to the teachers in the field and who critiques the teachers' performance.

Beginning teacher. A vocational or technical teacher with less than three years of teaching experience who does not have a college degree.

Pretest. An evaluated videotaped performance of a teacher teaching a five-minute lesson prior to instruction on specific teaching skills.

Posttest. An evaluated videotaped performance of a teacher teaching a five-minute lesson after completing an inservice education program on three teaching skills.

Micro-teaching. A scaled-down teaching session in which a teacher teaches a five-minute lesson to four students.

2

# APPENDIX A
# TABLES

## TABLE A

## AVERAGE AGE AND AVERAGE YEARS OF EXPERIENCE ON BACKGROUND CHARACTERISTICS OF THE PARTICIPANTS IN EACH TREATMENT GROUP

| Treatment Group | Age | Vocational Teaching Experience | Industrial Teaching Experience | Military Teaching Experience | Other Teaching Experience | Occupational or Work Experience | Level of Formal Education |
|---|---|---|---|---|---|---|---|
| I Video-Phone | 41.2 | 2.6 | 0.3 | 0.1 | 2.0 | 17.0 | 14.5 |
| II Video-Mail | 44.9 | 2.4 | 0.2 | 2.0 | 5.7 | 21.2 | 13.6 |
| III Video-Self-Evaluation | 36.3 | 2.1 | 0.2 | 0.1 | 0.1 | 14.8 | 14.0 |

## TABLE B

## PRETEST MEANS, STANDARD DEVIATIONS, VARIANCES AND RELIABILITY COEFFICIENTS OF ITEMS ON THE CRITIQUE FORM: INTRODUCING A LESSON

| Item | Mean | Standard Deviation | Variance | Reliability |
|---|---|---|---|---|
| 1 | 0.54 | 1.08 | 1.16 | 0.82 |
| 2 | 0.38 | 0.92 | 0.85 | 0.83 |
| 3 | 0.36 | 0.96 | 0.92 | 0.90 |
| 4 | 0.65 | 1.17 | 1.37 | 0.84 |
| 5 | 0.36 | 0.99 | 0.90 | 0.82 |
| 6 | 0.40 | 0.94 | 0.83 | 0.82 |
| 7 | 0.47 | 1.12 | 1.25 | 0.88 |
| 8 | 1.38 | 1.48 | 2.18 | 0.45 |
| 9 | 1.53 | 1.41 | 2.00 | 0.00 |
| Total | | | | 0.90 |

## TABLE C

## POSTTEST MEANS, STANDARD DEVIATIONS, VARIANCES AND RELIABILITY COEFFICIENTS OF ITEMS ON THE CRITIQUE FORM: INTRODUCING A LESSON

| Item | Mean | Standard Deviation | Variance | Reliability |
|---|---|---|---|---|
| 1 | 0.83 | 1.34 | 1.81 | 0.31 |
| 2 | 0.57 | 1.12 | 1.24 | 0.43 |
| 3 | 0.39 | 0.89 | 0.79 | 0.39 |
| 4 | 1.43 | 1.46 | 2.13 | 0.48 |
| 5 | 0.74 | 1.33 | 1.78 | 0.48 |
| 6 | 0.71 | 1.26 | 1.60 | 0.48 |
| 7 | 0.40 | 1.14 | 1.30 | 0.32 |
| 8 | 2.97 | 0.67 | 0.44 | 0.46 |
| 9 | 1.82 | 1.33 | 1.76 | 0.26 |
| Total | | | | 0.70 |

## TABLE D

### PRETEST MEANS, STANDARD DEVIATIONS, VARIANCES AND RELIABILITY COEFFICIENTS OF ITEMS ON THE CRITIQUE FORM: QUESTIONING

| Item | Mean | Standard Deviation | Variance | Reliability |
|---|---|---|---|---|
| 1 | 1.15 | 1.40 | 1.96 | 0.81 |
| 2 | 1.03 | 1.46 | 2.14 | 0.83 |
| 3 | 0.82 | 1.41 | 1.98 | 0.83 |
| 4 | 0.92 | 1.41 | 1.99 | 0.79 |
| 5 | 0.88 | 1.54 | 2.39 | 0.86 |
| 6 | 0.88 | 1.47 | 2.16 | 0.81 |
| 7 | 1.06 | 1.65 | 2.72 | 0.83 |
| 8 | 1.50 | 1.31 | 1.72 | 0.52 |
| 9 | 0.71 | 1.23 | 1.51 | 0.22 |
| 10 | 0.47 | 1.00 | 1.00 | 0.38 |
| 11 | 0.00 | 0.00 | 0.00 | ---- |
| Total | | | | 0.92 |

## TABLE E

### POSTTEST MEANS, STANDARD DEVIATIONS, VARIANCES AND RELIABILITY COEFFICIENTS OF ITEMS ON THE CRITIQUE FORM: QUESTIONING

| Item | Mean | Standard Deviation | Variance | Reliability |
|---|---|---|---|---|
| 1 | 2.40 | 1.21 | 1.46 | 0.79 |
| 2 | 1.74 | 1.38 | 1.92 | 0.85 |
| 3 | 1.58 | 1.39 | 1.94 | 0.75 |
| 4 | 1.85 | 1.67 | 2.80 | 0.90 |
| 5 | 1.58 | 1.51 | 2.27 | 0.82 |
| 6 | 2.06 | 1.39 | 1.94 | 0.86 |
| 7 | 2.31 | 1.44 | 2.07 | 0.83 |
| 8 | 1.89 | 1.50 | 2.24 | 0.94 |
| 9 | 1.42 | 1.44 | 2.08 | 0.78 |
| 10 | 1.97 | 1.41 | 2.00 | 0.92 |
| 11 | 0.53 | 1.07 | 1.14 | 0.42 |
| Total | | | | 0.96 |

## TABLE F

### PRETEST MEANS, STANDARD DEVIATIONS, VARIANCES AND RELIABILITY COEFFICIENTS OF ITEMS ON THE CRITIQUE FORM: DEMONSTRATING A MANIPULATIVE SKILL

| Item | Mean | Standard Deviation | Variance | Reliability |
|---|---|---|---|---|
| 1 | 0.54 | 1.01 | 1.03 | 0.83 |
| 2 | 0.40 | 1.05 | 1.10 | 0.96 |
| 3 | 0.46 | 1.12 | 1.25 | 0.97 |
| 4 | 0.64 | 1.08 | 1.18 | 0.81 |
| 5 | 0.40 | 1.02 | 1.05 | 0.96 |
| 6 | 0.54 | 1.14 | 1.30 | 0.91 |
| 7 | 0.43 | 1.09 | 1.19 | 0.91 |
| Total | | | | 0.97 |

## TABLE G

### POSTTEST MEANS, STANDARD DEVIATIONS, VARIANCES AND RELIABILITY COEFFICIENTS OF ITEMS ON THE CRITIQUE FORM: DEMONSTRATING A MANIPULATIVE SKILL

| Item | Mean | Standard Deviation | Variance | Reliability |
|---|---|---|---|---|
| 1 | 3.14 | 1.61 | 2.59 | 0.96 |
| 2 | 2.90 | 1.57 | 2.48 | 0.89 |
| 3 | 3.06 | 1.62 | 2.61 | 0.95 |
| 4 | 2.56 | 1.39 | 1.94 | 0.94 |
| 5 | 3.18 | 1.68 | 2.88 | 0.96 |
| 6 | 3.33 | 1.77 | 3.14 | 0.95 |
| 7 | 3.49 | 1.84 | 3.39 | 0.96 |
| Total | | | | 0.98 |

## TABLE H

### ANALYSIS OF COVARIANCE FOR PERFORMANCE DIFFERENCES ON THE COMPOSITE OF THREE TEACHING SKILLS AMONG TEACHERS RECEIVING VIDEO-PHONE, VIDEO-MAIL AND VIDEO-SELF-EVALUATION FEEDBACK

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Treatments | 2 | 247.70 | 123.85 | 0.32 |
| Within Groups | 32 | 12324.57 | 385.14 | |
| Total | 34 | 12572.27 | | |

P.05 $\geq$ 3.30 (with 2 and 32 degrees of freedom)

## TABLE I

### ANALYSIS OF COVARIANCE FOR TEACHING PERFORMANCE DIFFERENCES ON THE TEACHING SKILL OF INTRODUCING A LESSON AMONG TEACHERS RECEIVING VIDEO-PHONE, VIDEO-MAIL AND VIDEO-SELF-EVALUATION FEEDBACK

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Treatments | 2 | 10.45 | 5.23 | 0.14 |
| Within Groups | 32 | 1151.58 | 35.99 | |
| Total | 34 | 1162.03 | | |

P.05 $\geq$ 3.30 (with 2 and 32 degrees of freedom)

## TABLE J

### ANALYSIS OF COVARIANCE FOR TEACHING PERFORMANCE DIFFERENCES ON THE TEACHING SKILL OF QUESTIONING AMONG TEACHERS RECEIVING VIDEO-PHONE, VIDEO-MAIL AND VIDEO-SELF-EVALUATION FEEDBACK

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Treatments | 2 | 169.88 | 84.94 | 0.46 |
| Within Groups | 32 | 5850.38 | 182.82 | |
| Total | 34 | 6020.26 | | |

P.05 $\geq$ 3.30 (with 2 and 32 degrees of freedom)

## TABLE K

### ANALYSIS OF COVARIANCE FOR TEACHING PERFORMANCE DIFFERENCES ON THE TEACHING SKILL OF DEMONSTRATING A MANIPULATIVE SKILL AMONG TEACHERS RECEIVING VIDEO-PHONE, VIDEO-MAIL AND VIDEO-SELF-EVALUATION FEEDBACK

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Treatments | 2 | 371.03 | 185.52 | 1.60 |
| Within Groups | 32 | 3706.24 | 115.82 | |
| Total | 34 | 4077.27 | | |

P.05 $\geq$ 3.30 (with 2 and 32 degrees of freedom)

## TABLE L

## ANALYSIS OF VARIANCE FOR LEVEL OF SATISFACTION DIFFERENCES AMONG TEACHERS RECEIVING VIDEO-PHONE, VIDEO-MAIL AND VIDEO-SELF-EVALUATION FEEDBACK

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Squares | F |
|---|---|---|---|---|
| Treatments | 2 | 1177.56 | 588.78 | 0.94 |
| Within Groups | 33 | 20593.41 | 624.04 | |
| Total | 35 | 21770.96 | | |

P.05 $\geq$ 3.29 (with 2 and 32 degrees of freedom)

# APPENDIX B
# INSTRUMENTS

Instructor __________ Number ___
Tape No. ______ Panel Member ___

## CRITIQUE FORM
## INTRODUCING A LESSON

The introduction phase of a lesson "sets the stage" for student participation in the activity which is to follow. The introduction should help inspire the student to want to accomplish the objectives of the lesson.

The following items will be used to evaluate the teacher's introduction. If the teacher did not accomplish an item, only mark "Did Not Accomplish." If the teacher did accomplish the item, mark the box which describes how well he "Accomplished" that item.

| Did the Teacher in the Introduction: | Did Not Accomplish 0 | How Well Accomplished<br>Very Poor 1 | Poor 2 | Average 3 | Good 4 | Excellent 5 | Do Not Mark | |
|---|---|---|---|---|---|---|---|---|
| 1. State specifically what the objective/s of the lesson were in terms of student behavior? (For example: Did the teacher tell the student that he would be able to do things, such as bend, adjust, shape, test, solve, construct, contrast, etc.?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>26 | ☐<br>27 |
| 2. State why the objective/s were important in terms of student needs? (For example: Did the teacher state that the objective was important for the student to learn because of safety reasons, a future job, greater skill development, etc.?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>28 | ☐<br>29 |
| 3. State how the student would proceed in accomplishing the objective/s of the lesson? (For example: Did the teacher state what the student was to do in order to learn the objectives of the lesson? Examples are: Read certain material, practice using certain tools, solve certain problems, etc.) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>30 | ☐<br>31 |

| | How Well Accomplished<br>0 Did Not Accomplish | 1 Very Poor | 2 Poor | 3 Average | 4 Good | 5 Excellent | Do Not Mark | |
|---|---|---|---|---|---|---|---|---|
| 4. Relate the lesson to student's prior knowledge or experience? (For example: Did the teacher motivate the student by examples, illustrations, questions, or stories related to his background?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 32 | ☐ 33 |
| 5. React favorably toward student questions, answers, and comments? (For example: Did the teacher listen, pay attention, respond agreeably, etc.?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 34 | ☐ 35 |
| 6. Provide opportunity for student response and participation? (For example: Did the teacher allow the student to ask questions, make comments, or enter into class activities?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 36 | ☐ 37 |
| 7. State how the student would know when he had achieved the objective/s of the lesson? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 38 | ☐ 39 |
| 8. Express enthusiasm in the lesson? (For example: Did the teacher use speech and physical gestures to enthuse students?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 40 | ☐ 41 |
| 9. Use instructional aids? (For example: Did the teacher use real items, models, chalkboard, charts, etc.?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 42 | ☐ 43 |
| | | | | | | | ☐ 44 | ☐ 45-46 |

Instrument developed by the staff of Project 44, Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education, The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, and adapted for use by Department of Vocational Education, Colorado State University, Fort Collins, Colorado.

Instructor___________ Number ___
Tape No._______ Panel Member ___

## CRITIQUE FORM
## QUESTIONING

A question is an act or instance of asking. Questioning by the teacher promotes directed mental activity on the part of the student by providing opportunity for the student to be actively involved in the lesson. The question may be stated in words or may be simply an inquisitive facial expression or gesture. It requires some type of response on the part of the student: stating a fact; recalling a selected thought; making a comparison of two things; making a judgement; analyzing an attitude or appreciation; or, directing thought.

The effective use of questioning by the teacher increases student freedom of action, affords him more opportunities to express ideas, and makes him less dependent on the teacher.

The following items will be used to evaluate the teacher's questioning. If the teacher did not accomplish the item, only mark "Did Not Accomplish." If he did accomplish the item, mark the box which describes how well he accomplished the item.

|  | How Well Accomplished |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
| Did the Teacher in the Lesson: | Did Not Accomplish 0 | Very Poor 1 | Poor 2 | Average 3 | Good 4 | Excellent 5 | Do Not Mark |  |
| 1. Use questions to draw information from the students? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 26 | ☐ 27 |
| 2. Ask a question, pause to give the students time to think about the question, and then call on a student? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 28 | ☐ 29 |
| 3. After calling on a student, provide an opportunity for that student to think about the question before requiring his response? (Before answering the question himself or calling on someone else.) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 30 | ☐ 31 |
| 4. Present the questions in an orderly sequence? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ 32 | ☐ 33 |

|  |  | How Well Accomplished |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  | Did Not Accomplish<br>0 | Very Poor<br>1 | Poor<br>2 | Average<br>3 | Good<br>4 | Excellent<br>5 | Do Not Mark |  |
| 5. Control himself from repeating student responses? (For example: Did the teacher have the student repeat and clarify his response rather than repeating it himself?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>34 | ☐<br>35 |
| 6. Direct his questions so that each student was able to participate? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>36 | ☐<br>37 |
| 7. React favorably toward the students' answers to questions? (For example: Did the teacher give attention and consideration to the students' answers?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>38 | ☐<br>39 |
| 8. Ask questions which required more than "yes" and "no" answers? (For example: Did the teacher ask questions which required the student to apply ideas, principles, or facts to new situations?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>40 | ☐<br>41 |
| 9. Ask questions which the student could answer from past experience? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>42 | ☐<br>43 |
| 10. Ask questions which were clear and short enough to remember? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>44 | ☐<br>45 |

| | How Well Accomplished | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 Did Not Accomplish | 1 Very Poor | 2 Poor | 3 Average | 4 Good | 5 Excellent | Do Not Mark | |
| 11. Require the student to go beyond his first answers? (For example: Did the teacher encourage the student to expand an idea, back-up ideas with facts and illustrations, bring other students into the discussion by getting them to respond to the first student's answers?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>46 | ☐<br>47 |
| | | | | | | ☐<br>48-49 | | ☐<br>50-51 |

Instrument developed by the staff of Project 44, Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education, The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, and adapted for use by Department of Vocational Education, Colorado State University, Fort Collins, Colorado.

Instructor__________ Number ___
Tape No.________ Panel Member ___

## CRITIQUE FORM
## DEMONSTRATING A MANIPULATIVE SKILL

In helping the student learn an occupation, the teacher will be presenting new manipulative skills through a method of teaching known as the demonstration. If the teacher has given a good demonstration and the student has been a good observer and listener, the student should be ready to attempt to perform the manipulative skill safely and step-by-step.

The following items will be used to evaluate the teacher's demonstration. If the teacher did not accomplish the item, only mark "Did Not Accomplish." If the teacher did accomplish the item, mark the column which describes how well he "Accomplished" the item.

| | | How Well Accomplished | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Did the Teacher in the Demonstration:** | Did Not Accomplish<br>0 | Very Poor<br>1 | Poor<br>2 | Average<br>3 | Good<br>4 | Excellent<br>5 | Do Not Mark | |
| 1. Have all equipment, tools and materials ready for use? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>26 | ☐<br>27 |
| 2. Talk to the students and not to the tools or materials? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>28 | ☐<br>29 |
| 3. Present each step of the procedure, task, skill or operation in the proper sequence? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>30 | ☐<br>31 |
| 4. Briefly state what step is to be performed, how and why it is performed, then perform it? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>32 | ☐<br>33 |
| 5. Position himself and the students so that each step was easily seen (using visual aids to make clear any step that could not be clearly demonstrated)? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>34 | ☐<br>35 |
| 6. Present only one method of doing the operation giving only key points of information necessary to complete the task safely and efficiently? (Or did the teacher present two or more methods?) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>36 | ☐<br>37 |

How Well Accomplished

| | Did Not Accomplish | Very Poor | Poor | Average | Good | Excellent | Do Not Mark | |
|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | | |
| 7. Perform the manipulative skill with ease? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐<br>38 | ☐<br>39 |
| | | | | | | ☐<br>40 | ☐<br>41-42 | |

Instrument developed by the staff of Project 44, Assessment of Micro-Teaching and Video Recording in Vocational and Technical Teacher Education, The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, and adapted for use by Department of Vocational Education, Colorado State University, Fort Collins, Colorado.

# APPENDIX C
# MANNERISM INSTRUMENT

Instructor__________Number_____
Tape No._____Panel Member _____

## CRITIQUE FORM
## MANNERISMS OF TEACHING

The mannerisms displayed by teachers may have adverse effects on teaching performance. Some of these exaggerated adherences to particular speech habits, styles of presentation and other personal characteristics are believed to have annoying effects on students. Therefore, this instrument is designed to record the presence or absence of these mannerisms.

Check no or yes for each item.

| | Did the Teacher: | NO<br>0 | YES<br>1 | DO NOT MARK |
|---|---|---|---|---|
| 1. | Maintain good posture? | ☐ | ☐ | ☐<br>26 |
| 2. | Make effective use of hand gestures? | ☐ | ☐ | ☐<br>27 |
| 3. | Minimize fidgeting with the chalk, eraser, clothing, etc.? | ☐ | ☐ | ☐<br>28 |
| 4. | Keep hands free (not in pocket or with arms crossed in front of his body)? | ☐ | ☐ | ☐<br>29 |
| 5. | Maintain eye contact with the students? | ☐ | ☐ | ☐<br>30 |
| 6. | Speak in a clear, audible voice without stuttering or mumbling? | ☐ | ☐ | ☐<br>31 |
| 7. | Appear calm, confident and sure of himself? | ☐ | ☐ | ☐<br>32 |
| 8. | Minimize the repeating of certain words or phrases? | ☐ | ☐ | ☐<br>33 |
| 9. | Dress appropriately for the teaching situation? | ☐ | ☐ | ☐<br>34 |
| 10. | Appear well groomed? | ☐ | ☐ | ☐<br>35 |
| | | | | ☐<br>36-37 |

# APPENDIX D
# SATISFACTION SCALE

# SATISFACTION SCALE FOR EXPRESSION OF SATISFACTION WITH REMOTE TEACHER EDUCATION

The purpose of this Satisfaction Scale is to allow you to rate statements which best describe your feelings of satisfaction and/or dissatisfaction with the method of remote teacher education in which you were involved. This scale will be treated as confidential material.

DIRECTIONS

When completing the Satisfaction Scale, think in terms of the method of remote teacher education in which you were involved. You are to rate the statements on a nine (9) point scale; circle the number 9 for those statements with which you strongly agree with respect to the method of remote teacher education in which you were involved; circle 1 for those statements with which you strongly disagree with respect to the method, or any number in between which you think describes your degree of agreement to the remote inservice education received.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Strongly Disagree | | Disagree | | Relatively Neutral | | Agree | | Strongly Agree |

Circle the number which best describes your rating for each statement in the column on the right as shown in the example below.

EXAMPLE:

1. The method of remote teacher education in which I was involved helped me get a salary increase. [✓ 1] 2 3 4 5 6 7 8 9

## SATISFACTION SCALE

1. The method of remote teacher education in which I was involved: helped me to look at my classroom teaching as others see my teaching. 1 2 3 4 5 6 7 8 9

2. The method of remote teacher education in which I was involved: caused me to be unsure during the first few weeks. 1 2 3 4 5 6 7 8 9

3. The method of remote teacher education in which I was involved: encouraged me to do my best work. 1 2 3 4 5 6 7 8 9

4. The method of remote teacher education in which I was involved: helped me to use approved methods in my classroom teaching. 1 2 3 4 5 6 7 8 9

5. The method of remote teacher education in which I was involved: provided enough instruction from the teacher educator. 1 2 3 4 5 6 7 8 9

6. The method of remote teacher education in which I was involved: was an unsatisfactory method of teacher education for my particular situation. 1 2 3 4 5 6 7 8 9

7. The method of remote teacher education in which I was involved: was directed toward identifying my weaknesses. 1 2 3 4 5 6 7 8 9

8. The method of remote teacher education in which I was involved: developed a friendly working relationship between the teacher educator and myself. 1 2 3 4 5 6 7 8 9

9. The method of remote teacher education in which I was involved: encouraged me to work on self-improvement of my teaching. 1 2 3 4 5 6 7 8 9

10. The method of remote teacher education in which I was involved: left me in doubt about what was expected of me. 1 2 3 4 5 6 7 8 9

11. The method of remote teacher education in which I was involved: allowed for private communication between myself and the teacher educator. 1 2 3 4 5 6 7 8 9

12. The method of remote teacher education in which I was involved: left me unsure even during the last few weeks. 1 2 3 4 5 6 7 8 9

13. The method of remote teacher education in which I was involved: allowed me to receive instructions at a time convenient to me. 1 2 3 4 5 6 7 8 9

14. The method of remote teacher education in which I was involved: helped me to see my teaching problems more clearly. 1 2 3 4 5 6 7 8 9

15. The method of remote teacher education in which I was involved: helped me to feel more successful with each teaching session. 1 2 3 4 5 6 7 8 9

16. The method of remote teacher education in which I was involved: limited the teacher educator from seeing my real ability to teach. 1 2 3 4 5 6 7 8 9

17. The method of remote teacher education in which I was involved: included information with which I did not agree. 1 2 3 4 5 6 7 8 9

18. The method of remote teacher education in which I was involved: required too much preparation for the benefits I received. 1 2 3 4 5 6 7 8 9

19. The method of remote teacher education in which I was involved: required more of my time than was necessary. 1 2 3 4 5 6 7 8 9

20. The method of remote teacher education in which I was involved: helped me to identify the good and bad points of my teaching. 1 2 3 4 5 6 7 8 9

21. The method of remote teacher education in which I was involved: needed more communication between the teacher educator and myself. 1 2 3 4 5 6 7 8 9

22. The method of remote teacher education in which I was involved: did not make maximum use of my own contribution for improving my teaching performance. 1 2 3 4 5 6 7 8 9

23. The method of remote teacher education in which I was involved: was a frustrating procedure for me. 1 2 3 4 5 6 7 8 9

24. The method of remote teacher education in which I was involved: made me more aware of the variety of help that I can obtain from the university. 1 2 3 4 5 6 7 8 9

25. The method of remote teacher education in which I was involved: limited my use of the various approaches to teaching. 1 2 3 4 5 6 7 8 9

26. The method of remote teacher education in which I was involved: helped me to improve other parts of my teaching performance. 1 2 3 4 5 6 7 8 9

27. The method of remote teacher education in which I was involved: resulted in a superficial evaluation of my teaching performance. 1 2 3 4 5 6 7 8 9

28. The method of remote teacher education in which I was involved: was highly satisfying once working relations and procedures were established. 1 2 3 4 5 6 7 8 9

29. The method of remote teacher education in which I was involved: created a tense atmosphere between my students and myself. 1 2 3 4 5 6 7 8 9

30. The method of remote teacher education in which I was involved: helped me to improve my teaching. 1 2 3 4 5 6 7 8 9

31. The method of remote teacher education in which I was involved: improved my relationship with my fellow teachers. 1 2 3 4 5 6 7 8 9

32. The method of remote teacher education in which I was involved: created problems between my immediate supervisor and myself. 1 2 3 4 5 6 7 8 9

Instrument developed by the staff of Project 44, Assessment of Micro-teaching and Video Recording in Vocational and Technical Teacher Education, The Center for Vocational and Technical Education, The Ohio State University, Columbus, Ohio, and adapted for use by Department of Vocational Education, Colorado State University, Fort Collins, Colorado.

# APPENDIX E

# PANEL ORIENTATION AND RATING PROCEDURES

# PANEL ORIENTATION AND RATING PROCEDURES

The orientation for the panel consisted of the following procedures:

1. The panel members reviewed the items on each of the three evaluation instruments and the items on mannerisms.

2. The instructional model for introducing a lesson was viewed by the panel. As the panel members viewed the instructional model, they discussed each item on the critique form.

3. Next, two teaching sessions from another experiment at The Center were viewed and rated to give each member of the panel an opportunity to gain expertise in rating teachers on the teaching skill of introducing a lesson.

4. After viewing each teaching session and rating them independently the panel members discussed the ratings given each item on the critique form and defended the ratings that they had given.

5. Procedures two, three and four were repeated for the teaching skills of questioning and demonstrating a manipulative skill.

6. After the panel members had become familiar with the three instruments, they rated one teaching session on all three teaching skills. Again, the panel members discussed their ratings on each item of the three critique forms.

7. Number six was repeated until a rater reliability correlation coefficient of .90 was obtained.

In order to prevent the possibility of panel members being able to identify pretest and posttest teaching sessions, the "double blind" technique of presenting videotapes for viewing was used. This technique was set up in the following manner:

1. The pretest videotaped sessions were paired with the posttest videotaped sessions so that no teacher's pretest and posttest would be rated in sequence or during the same rating session.

2. The pairs of pretest and posttest teaching sessions were divided into four blocks of nine pairs each (there were 36 pretests and 36 posttests). This procedure provided

for the inclusion of 18 teaching sessions in each of the four blocks.

3. The nine pairs of pretests and posttests in each block were assigned a number from one to nine and these numbers were used for selecting a random order for viewing the tapes. When an odd numbered pair was selected the pretest was viewed first; when an even numbered pair was selected, the posttest was viewed first.

| Pretest Teacher Number | | Posttest Teacher Number | Blocks | Rating Session |
|---|---|---|---|---|
| 1 through 9 | Pair 1 through Pair 9 | 36 through 28 | I | (1)<br>R 1,3,2,8,9,4,5,6,7 |
| 10 through 18 | Pair 1 through Pair 9 | 27 through 19 | II | (2)<br>R 4,6,9,1,3,7,5,2,8 |
| 19 through 27 | Pair 1 through Pair 9 | 18 through 10 | III | (3)<br>R 2,6,3,1,4,5,9,8,7 |
| 28 through 36 | Pair 1 through Pair 9 | 9 through 1 | IV | (4)<br>R 7,4,8,5,2,9,1,3,6 |

R - Pairs 1-9 in each block were viewed in random order as identified by a table of random numbers. When an odd-numbered pair (1,3,5,7,9) was selected the pretest was viewed first; when an even-numbered pair (2,4,6,8) was selected the posttest was viewed first.

Figure 1. The Double Blind Viewing Technique

One block of nine pairs of pretest and posttest teaching sessions was viewed and rated during each of the four rating sessions. The rating sessions were four hours in duration and panel members took a break every two hours.